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Shunpu Li

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EXAMINER

BROWN II, DAVID N

ART UNIT

PAPER NUMBER

1791

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/534,931	<b>Applicant(s)</b> LI, SHUNPU	
	<b>Examiner</b> DAVID N. BROWN II	<b>Art Unit</b> 1791	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 November 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 9-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/05/2008</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of group I (claims 1-8) in the reply filed on 11/03/2008 is acknowledged. The traversal is on the ground(s) that group I should encompass claims 1-13 and that group III is not a separate invention as it is the method of making the product of group I. This is not found persuasive because:

When the limitations of claim 1 are brought into claim 9, claim 9 becomes

A method of manufacture of a structure on the nanometre scale comprising the steps of:  
providing A template formed from a layered structure comprising a substrate and a single-phase polymer layer positioned on the substrate, wherein the polymer layer comprises a textured surface, the texturing being caused by induction of stress in the polymer layer (as defined in claim 1); molding a material on to the template; and removing the molded material from the template to provide a structure on the nanometre scale

which is an *independent* claim addressing a method of making a template instead of a product as in claim 1. Because the product and method claims belong to different statutory categories the search over both categories provides a serious burden on the examiner. Additionally, as stated previously, that which is the common technical feature has been found to not be special. The requirement is still deemed proper and is therefore made FINAL.

### ***Drawings***

2. The drawings were received on 11/03/2008. These drawings are accepted.

***Specification***

3. The title of the invention is descriptive.

***Response to Arguments***

4. Applicant's arguments filed 11/03/2008 have been fully considered but they are not persuasive.

5. Although Lee is silent as to whether or not the polymer discussed in col. 1 lines 33-34 is single-phase or not, the "single-phase" limitation is a property of the polymer being used. If "single-phase" is taken to mean that the polymer is not a mixture of solid phases, Lee is silent as to the polymer being used being of multiple phases. For this reason the examiner asserts that the polymer must be a single phase polymer.

6. The limitation "a template" (claim 1) is not considered a limitation of significance because the body of a claim fully and intrinsically sets forth all of the limitations of the claimed invention, and the preamble merely states the purpose or intended use of the invention. If the body of a claim fully and intrinsically sets forth all of the limitations of the claimed invention, and the preamble merely states, for example, the purpose or intended use of the invention, rather than any distinct definition of any of the claimed invention's limitations, then the preamble is not considered a limitation and is of no significance to claim construction. *PitneyBowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305, 51 USPQ2d 1161, 1165 (Fed. Cir. 1999). See also *Rowe v. Dror*, 112 F.3d 473,478, 42 USPQ2d 1550, 1553 (Fed. Cir. 1997). For this reason the intended use of the product does not preclude it from meeting the claims.

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7. With regard to the Schaper art, claim 1 requires "induction of stress" without further defining how the stress is to be induced. The spin coating process itself inherently applies stress to the fluid as shear forces from the master act against the polymer layer during the spinning process. Schaper also teaches using PVA as the polymer without mentioning any additional solid phase. Additionally, the discussion of single-phase with regard to Lee applies here also.

8. With regard to Chou, Chou teaches a layered structure with a substrate and a polymer layer on the substrate, that layer having a textured surface formed by induction of stress. Since this meets applicant's claim to a template, it must itself be a template. Also Chou teaches using PMMA without the mention of an additional phase. Chou therefore teaches using a single phase polymer. Additionally, the discussion of single-phase with regard to Lee applies here also.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting

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directly or indirectly from an international application filed before November 29, 2000.

Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1 and 6 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 6,755,984 (Lee).

Applicant requires a layered template with a substrate and textured polymer layer. Applicant requires the use of a single-phase polymer. For the purposes of this action, "phase" will be taken to refer to the state of matter, for example; solid, liquid, or gas. The polymer layer hardens and solidifies upon curing making it a single phase layer. In figure 2 there is a substrate (205) layer and a mask (203) layer. The mask layer is made from a polymer according to column 1 lines 33-34 and its texture/impression (207) is formed by application of compression force (i.e. by inducing stress" to the polymer. While the end product comprising textured mask layer and substrate of Lee et al is taken to be capable of functioning as a template since it is capable of imprinting a surface of a substrate such as a curable gel.

Claim 6:

The nano-size impressions (207) are shown in figure 2 to be substantially parallel. They are taken to be the grooves as claimed by the applicant. The spaces (206) separating the lines (204) according to figure 5 are shown to be parallel. They are also taken to be grooves as claimed by applicant.

3. Claims 1, 2, 4, and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,849,558 (Schaper).

Applicant requires a layered template with a substrate and textured polymer layer. In figure 13a, one such template is displayed. This template (610,620, and 630) comprises an adhesive coated carrier (620 and 630 is taken to be the substrate) and a textured polymer layer (610; taken to be the claimed polymer layer). Since the textured polymer is completely solid, it is considered to be a single phase. Stress is induced during the imprinting steps forming the template (610) when it is impressed by the master (600) as in any of the prior art examples provided in figures 1-4 or in figure 12 according to the Schaper invention.

Claims 2 and 4:

The sputtered-on layer (1302) may be a layer of germanium is applied onto a surface of the textured polymer layer as taught in claim 40 and as shown in figure 13a.

Claim 8:

According to column 8 lines 38-39, the germanium layer has a thickness in the order of 10nm.

4. Claims 1, 3, and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Chou (US 2002/0132,482).

Chou teaches in paragraph [0021] that the substrate typically comprises a semiconductor material such as silicon. Continuing in the 4<sup>th</sup> line of the same paragraph Chou teaches the film can be a thermoplastic polymer such as PMMA. This polymer would have to be completely solidified in order to function as intended; therefore it is a single-phase polymer. The arrangement of the polymer on the silicon wafer can be seen in figure 2 of the Chou patent. Here the film is labeled 21 and the

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wafer is labeled 20. The combined device (20 and 21) is taken to be the template claimed. In figure 4b, the patterns made in the PMMA can be seen as there are recesses (41) and thick regions (43). In paragraph [0029] lines 4-7, Chou teaches that the molded film will be patterned with raised features and recesses. Chou mentions the stresses (heating and cooling) in paragraph [0028] from line 6-10. Also, the imprint method used to create the recessed patterns in the device can be seen as another induced stress. For the same reasons set forth above, the result article of Chou is taken to be capable of functioning as a template.

Claim 3:

Chou uses PMMA for the polymer layer as previously discussed.

Claim 5:

Chou teaches in paragraph [0021] that the substrate typically comprises a semiconductor material such as silicon.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:



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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chou as applied to claim 1 above

Chou teaches in paragraph [0020] that the thickness of layer (21) can be from .1nm to 10 $\mu$ m. Applicant claims a narrower range of 50-300nm. It would have been obvious to one having ordinary skill in the art at the time of the invention to form the polymer layer such that it has a thickness recited in this claim because one in the art would have chosen a thickness range which falls within the workable range taught by the prior art reference.

### ***Conclusion***

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID N. BROWN II whose telephone number is (571)270-5497. The examiner can normally be reached on Monday-Thursday 7:30a-5:00p EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Del Sole can be reached on (571)-272-1130. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DAVID N. BROWN II/  
Examiner, Art Unit 1791

/Joseph S. Del Sole/  
Supervisory Patent Examiner, Art Unit 1791